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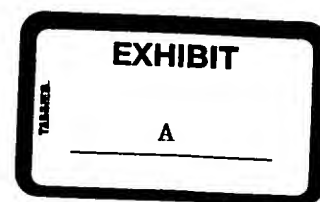
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TECHNICAL FIELD

[Industrial Application] this invention relates to the emulsification dispersant for rosin system emulsion sizing compounds, and the sizing compound for paper manufacture which used this emulsification dispersant.

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PRIOR ART

[Description of the Prior Art] In the conventional rosin system emulsion sizing compound for paper manufacture, saponification rosin, an anion system surfactant, casein, etc. are used as an emulsification dispersant of the rosin system matter. However, in the case of the rosin system emulsion sizing compound which used saponification rosin, the anion system surfactant (JP,60-133052,A), for example, a polyoxyethylene-alkyl-ether sulfate salt, the poliomyelitis KISHIECHI range styrene-ized phenyl-ether sulfo succinic-acid ester salt (JP,59-48064,B), etc., workability is worsened for the foaming nature in a paper-making process, and it has become the cause which causes the fall of a size effect. Moreover, when the casein extracted from the natural product is made into a dispersant, although improved, since the emulsion of a fine particle is not obtained, the foaming nature in a paper-making process itself has inadequate size nature, and a problem is in the stability with the passage of time by decomposition etc. [0003] in addition, an anionic synthetic-macromolecule type emulsification dispersant is proposed -- **** (JP,2-53555,B, this common one No. 189343 [one to], this common one No. 203031 [one to], this common one No. 203032 [one to], this common No. 33393 [two to]) -- these have an inadequate performance as an emulsification dispersant of the rosin system matter, the manufactured emulsion has a coarse particle and a big problem remains in the stability itself Furthermore, there are many faults, such as a fall of the size effect by the stability at the time of receiving mechanical shearing force, the stability at the time of the hard water dilution, and the foaming nature in a paper-making process.

[0004] Moreover, although the need of advancing recycling-ization of used paper from the standpoint of a deployment of closed ** of Hakusui of a paper-making system or wood resources has been increasing from the environmental protection side in recent years, since a calcium carbonate is contained in used paper, there is a problem of needing a lot of sulfuric-acid van soil, causing a white hardness rise as a result, and causing the fall of a size effect at the time of sizing. The addition of sulfuric-acid van soil is reduced, and the synthetic-macromolecule type emulsification dispersant (others [JP,63-120198,A]) of a cation system is proposed in order to perform paper making in a high pH field (neutrality - weak alkalinity) more. However, these have the emulsification force and inadequate dispersion force, the particle of the obtained rosin system emulsion is coarse, and it is impossible for there to be a problem in storage etc. and to use it as a substance top emulsion sizing compound. Furthermore, since a size effect is low and it is almost especially ineffective in a neutrality - weak alkaline field, the merit by the cation system is not demonstrated at all. Moreover, although the method of mixing the cation nature matter to an anionic rosin system emulsion, and changing into a cation nature emulsion (sizing compound) etc. is proposed (others [common / this / JP,2-293492,A and / No. 893 / three to] /), since it becomes two steps of manufactures of manufacturing an anionic emulsion with an anion system emulsification dispersant first, adding a cation system dispersant, an aluminum chloride, an aluminum sulfate, etc. next, and obtaining a cation nature rosin emulsion. Since a process is long, and becomes complicated and two or more kinds of additives (emulsification dispersant) are moreover needed as compared with the method of manufacturing a direct cation nature rosin emulsion with a cation system emulsification dispersant, a cost rise is not avoided, but since the upper emulsion particle is coarse, a size effect is also bad inadequate [stability].

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EFFECT OF THE INVENTION

[Effect of the Invention] As it explains above and being proved, in this invention The distributed state when carrying out emulsification distribution of the rosin system matter being very detailed and the outstanding distributed stability are shown. By hypoviscosity, it is easy to deal with dispersion liquid, and they add. and it not only excels in the distributed stability at the time of the hard water dilution, but Foaming in a paper-making process is low, and could offer the new emulsification dispersant for rosin system emulsion sizing compounds and new sizing compound which may discover the size effect which excels in the conventional rosin system emulsion sizing in wide range pH field applied to acid shell weak alkalinity. Therefore, it can contribute to an improvement of a paper manufacture process.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The distributed stability which was [this invention] very detailed at the time of emulsification distribution of the rosin system matter, and was excellent in view of the above actual condition, [of the emulsion particle] Machine stability and storage stability are shown and moreover it is easy to deal with dispersion liquid by hypoviscosity. In addition, excel in the distributed stability at the time of the hard water dilution, and foaming in a paper-making process is low. It aims at offering the new emulsification dispersant for rosin system emulsion sizing compounds and the rosin system emulsion sizing compound for paper manufacture which may discover the size effect which excels in the conventional rosin system emulsion sizing in wide range pH field applied to acid shell weak alkalinity.

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MEANS

[Means for Solving the Problem] (1) In order to attain the technical problem beyond an outline, the emulsification dispersant for rosin system emulsion sizing compounds concerning this invention makes 2 and 4-diphenyl-4-methyl-1-pentene (a) an indispensable chain transfer agent, and is characterized by the bird clapper from the copolymer and/or its salt of an acrylic-ester (meta) system and/or a styrene system monomer (b), and the amino group and/or an ammonium content monomer (c) (salt). A term division is hereafter carried out per [the composition of invention] main matters, and it describes.

[0007] (2) Chain transfer agent (a)

It is well-known for molecular weight control of a polymer (**) to be possible by using the 2 and 4-diphenyl-4-methyl-1-pentene which is a chain transfer agent (a) in this invention as a chain transfer agent at the time of carrying out the polymerization of the vinyl-ester system monomer (JP, 56-45490, B, JP, 58-217511, A, and this Showa 59 - No. 81322). However, by using the above-mentioned compound (a) for molecular weight control of a copolymer (emulsification dispersant) as a result of research A thiol, a halocarbon, a halogenated hydrocarbon, an amine, a nitro compound, alcohol, a sulfide, a sulfoxide, a sulfone, disulfide, etc. are compared with the case where other chain transfer agents are used. When this copolymer was used and the rosin system matter was emulsified and distributed, very detailed emulsion manufacture of a dispersing element particle was attained, distributed stability was very good and it was found out that the outstanding emulsion sizing compound of sediment with time or an aggregate which is not almost can be invented. foaming nature [in / a paper-making process / since the emulsion obtained in this way has low viscosity, while handling is easy, it excels in the distributed stability at the time of the hard water dilution, and] -- low -- and acid shell weakness -- effective in wide range pH field applied alkaline -- etc. -- it is a rosin system emulsion sizing compound with the size effect which is not in the conventional sizing compound and which stood high

[0008] Although the byproduction of a 2 and 4-diphenyl-4-methyl-2-pentene, the 1, 1, and 3-trimethyl-3-phenyl indan, etc. is carried out in many cases as a by-product at the time of composition of 2 and 4-diphenyl-4-methyl-1-pentene (a), since the effect as a chain transfer agent is in these by-products, (a) may be mixture with these by-products.

[0009] It is also possible to use together chain transfer agents other than (a) on the occasion of composition of the copolymer in this invention (emulsification dispersant). As a chain transfer agent of an except, (a) For example, a methanethiol, ethanethiol, A propane thiol, a butane thiol, an octane thiol, a dodecane thiol, A benzene thiol, a toluene thiol, alpha-naphthalene thiol, beta-naphthalene thiol, A mercapto methanol, a mercaptoethanol, mercapto propanol, A mercapto butanol, a thioglycolic acid or this methyl, ethyl, A propyl, butyl, n-octyl, 2-ethylhexyl, a dodecyl, A benzyl, methoxy ethyl, methoxy butyl ester, beta-mercaptopropionic acid, or this methyl, Ethyl, a propyl, butyl, n-octyl, 2-ethylhexyl, a dodecyl, Mercaptans, such as benzyl, methoxy ethyl, methoxy butyl ester, and trimethylol-propane tris - (beta-mercaptopropionate), Halocarbons, such as a carbon tetrachloride and carbon tetrabromide, BUROMO trichloroethane, Halogenated hydrocarbons, such as a bromobenzene, a trimethylamine, a triethylamine, Tripropylamine, tributylamine, N,N-dimethylaniline, Nitro compounds, such as amines, such as N and N-diethylaniline, and m-dinitrobenzene, Alcohols, such as sec-butyl alcohol, aldehydes,

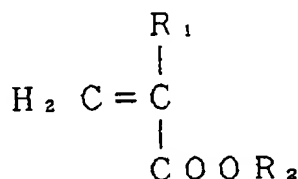
and sulfides Sulfoxides, sulfones, others, hypophosphite, a cumene, an anthracene, an allyl compound, a diisobutylene, a terpinolene, beta-terpinene, gamma-terpinene, 1, 4-cyclohexadiene, the 2-methyl -1, 4-cyclohexadiene, etc. can be mentioned.

[0010] The aforementioned chain transfer agent can be used together in the amount of the grade which does not check the effect as emulsification dispersibility ability and a sizing compound etc.

[0011] (3) Monomer component (b)

Setting to the monomer which constitutes the copolymer (emulsification dispersant) concerning this invention, the acrylic-ester (meta) system monomer of a monomer (b) is the following general formula-ization 8. [0012]

[Formula 8]



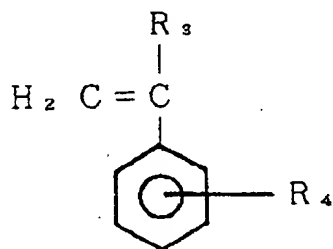
(式中 R₁ は水素又はメチル基を、R₂ は炭素原子数 1 ～ 22 個のアルキル基、アルケニル基、シクロアルキル基、シクロアルケニル基、アリール基、アラルキル基又はアラルケニル基を示す。)

[0013] They are one or more kinds of monomers chosen from the group which comes out and consists of a monomer expressed. For example, a methyl acrylate (meta), an ethyl acrylate (meta), acrylic-acid (meta) n-butyl, Isobutyl acrylate, acrylic-acid (meta) sec-butyl, (Meta) Acrylic-acid tert-butyl, an acrylic-acid (meta) n-octyl, (Meta) Acrylic-acid 2-ethylhexyl, an acrylic-acid (meta) desyl, (Meta) An acrylic-acid dodecyl, acrylic-acid (meta) hexadecyl, acrylic-acid (meta) octadecyl, (Meta) (Meta) Acrylic-acid octadecenyl, acrylic-acid (meta) icosyl, acrylic-acid (meta) DOKOSHIRU, acrylic-acid (meta) cyclopentyl, acrylic-acid (meta) cyclohexyl, an acrylic-acid (meta) benzyl, etc. are mentioned. Especially, the methyl, the ethyl, n-butyl, the isobutyl, the sec-butyl, 2-ethylhexyl, cyclohexyl, or benzyl ester of an acrylic acid (meta) is desirable.

[0014] The styrene system monomer of a monomer (b) is the following general formula-ization 9.

[0015]

[Formula 9]



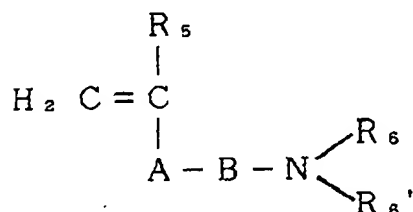
(式中 R₃ は水素又はメチル基を、R₄ は水素、メチル基、エチル基、イソプロピル基又は tert-ブチル基を示す。又 R₄ はフェニル基の 2 ～ 6 位のいずれの位置にあっても良い)

[0016] It is one or more kinds of monomers chosen from the group which comes out and consists of a monomer expressed, for example, styrene, an alpha methyl styrene, o-, m-, p-methyl styrene, o-, m-, p-ethyl styrene, o-, m-, p-isopropyl styrene, o-, m-, p-tert-butyl styrene, etc. are raised, and styrene, an alpha methyl styrene, m-, and p-methyl styrene are especially desirable. in addition, a monomer (b) -- acrylic-ester (meta) system independence or a styrene system -- it may be independent and you may be both combined use

[0017] (4) Monomer component (c)

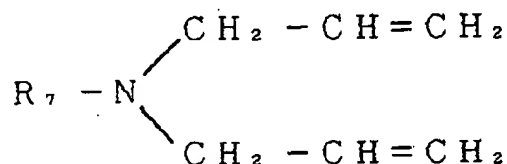
Setting to the monomer which constitutes the copolymer (emulsification dispersant) concerning this invention, the amino-group content monomer of a monomer (c) is the general-formula[following]-izing 10 and/or ** 11. [0018]

[Formula 10]



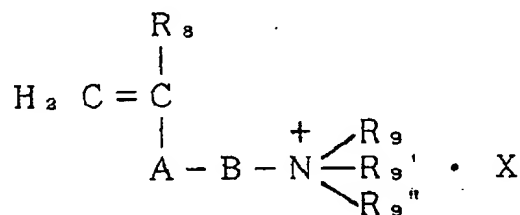
[0019]

[Formula 11]



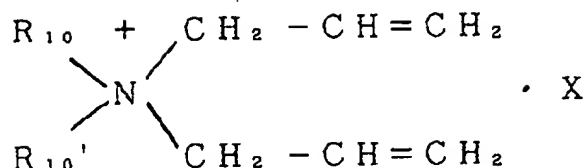
[0020] The ammonium content monomer of a monomer (c) is the formation 12 of the following general formula, and/or ** 13. [0021]

[Formula 12]



[0022]

[Formula 13]



(式中 R_5 、 R_6 は水素又はメチル基を、 R_6 、 R_6' 、 R_7 は水素、メチル基、エチル基、プロピル基、ベンジル基、ヒドロキシエチル基、ヒドロキシプロピル基、ジヒドロキシプロピル基又はグリシジル基を、 R_9 、 R_9' 、 R_9'' 、 R_{10} 、 R_{10}' はメチル基、エチル基、プロピル基、ベンジル基、ヒドロキシエチル基、ヒドロキシプロピル基、ジヒドロキシプロピル基又はグリシジル基を、 A は $-CO-O-$ 又は $-CO-NH-$ を、 B は $-(CH_2)_2-$ 、 $-(CH_2)_3-$ 、 $-CH_2C(CH_3)_2CH_2-$ 又は $-CH_2CH(OH)CH_2-$ を、 X は塩を形成するアニオンを示す。)

[0023] They are one or more kinds of monomers (salt) chosen from the group which comes out and consists of a monomer (salt) expressed. For example, (meta), acrylic-acid aminoethyl ester (amide), acrylic-acid (meta) aminopropyl ester (amide), Acrylic-acid amino neopentyl ester (amide), acrylic-acid (meta) amino-2-hydroxy propyl ester (amide), (Meta) And what used the 1st class amines of these as secondary amine, tertiary amine, and the 4th class ammonium (salt), and the thing which used the secondary amine of a diarylamine as tertiary amine and the 4th class ammonium (salt) are raised.

[0024] Preferably Acrylic-acid (meta) N and N-dimethylaminoethyl ester (amide), Acrylic-acid N and N-dimethylamino propyl ester (amide), (Meta) Acrylic-acid N and N-dimethylamino-2-hydroxy propyl ester (amide), (Meta) Acrylic-acid N and N-dimethylamino neopentyl ester (amide), (Meta) Acrylic-acid N and N-diethylaminoethyl ester (amide), (Meta) Acrylic-acid N and N-diethylamino propyl ester (amide), (Meta) Acrylic-acid N and N-diethylamino-2-hydroxy propyl ester (amide), (Meta) Acrylic-acid N and N-diethylamino neopentyl ester (amide), (Meta) And the 4th class ammonium (salt) of these, a methyl diarylamine, dimethyl diaryl ammonium (salt), Methyl diaryl hydroxyethyl ammonium (salt), methyl diaryl -2, 3-dihydroxy propyl AMMONIMU, etc. are raised. still more preferably Acrylic-acid N and N-dimethylaminoethyl ester and acrylic-acid (meta) N and N-dimethylamino-2-hydroxy propyl ester, (Meta) An acrylic-acid N and N-dimethylamino propyl amide and acrylic-acid (meta) N and N-dimethylamino-2-hydroxypropyl amide, (Meta) Acryloyloxyethyl trimethylammonium (salt), (Meta) The acryloyloxyethyl dimethyl -2, 3-dihydroxy propyl ammonium (salt), (Meta) (meth)acryloyloxy-2-hydroxypropyl trimethylammonium (salt), Acryloyloxyethyl dimethyl propyl ammonium (salt), (Meta) Acryloyloxyethyl dimethylbenzyl ammonium (salt), (Meta) Acryloyloxyethyl dimethyl glycidyl ammonium (salt), (Meta) Acryloyl aminopropyl trimethylammonium (salt), (Meta) The acryloylamino propyl dimethyl -2, 3-dihydroxy propyl ammonium (salt), (Meta) Acryloylamino-2-hydroxypropyl trimethylammonium (salt), (Meta) Acryloylamino PUROPIRUJI methylpropyl ammonium (salt), (Meta) (Meta) Acryloyl aminopropyl dimethylbenzyl ammonium (salt), acryloylamino (meta) PUROPIRUJIMECHIRU glycidyl ammonium (salt), and dimethyl diaryl ammonium (salt) are raised. In addition, it is here (meta), and an acryloyl (meta) means an acryloyl and/or a meta-acryloyl, and, as for an acrylic, ester (amide) means an ester compound and/or an amide compound for an acrylic and/or methacrylic one.

[0025] Moreover, as for a monomer (c), it is desirable that they are salts, such as a hydrochloric acid, a hydrobromic acid, a sulfuric acid, a phosphoric acid, methylsulfuric acid, an ethyl sulfuric acid, an acetic acid, a formic acid, an acrylic acid (meta), and a hydroxide. It is the salt of a hydrochloric acid, a sulfuric acid, methylsulfuric acid, and an ethyl sulfuric acid especially preferably.

[0026] (5) Other monomer components (d)

this invention copolymer can contain various hydrophilic copolymerization components in addition to the fundamental component of above-mentioned (a) - (c). As an example of the monomer of a hydrophilic property, a vinylpyridine, N-methyl vinyl pyridinium (salt), Vinylpyridine system monomers, such as N-ethyl vinyl pyridinium (salt) and N-hydroxyethyl vinyl pyridinium (salt), Amino styrene, N-methylamino styrene, N, and N-dimethylamino styrene, Amino styrene system monomers, such as trimethyl styryl ammonium (salt), Amino alkyl styrene system monomers, such as N and N-dimethylamino methyl styrene and trimethyl styryl methylammonium (salt), Vinyl-ester system monomers, such as vinyl acetate, an acrylonitrile (meta) system monomer, Everything but dicarboxylic-acid (and anhydride) system monomers, such as a maleic acid, a maleic anhydride, boletic acid, an itaconic acid, itaconic acid anhydride, a citraconic acid, an anhydrous citraconic acid, and a mesaconic acid, can present the following examples further.

[0027] Dicarboxylic-acid monoester system monomer : Maleic-acid monomethyl, maleic-acid monoethyl, Maleic-acid monopropyl, maleic-acid monobutyl, a maleic-acid monochrome n-octyl, Maleic-acid monochrome 2-ethylhexyl, a maleic-acid monochrome dodecyl, maleic-acid monochrome octadecyl, Maleic-acid monochrome octadecenyl, maleic-acid monochrome cyclohexyl, a maleic-acid monochrome benzyl, Boletic acid monomethyl, boletic acid monoethyl, boletic acid monopropyl, Boletic acid monobutyl, a boletic acid monochrome n-octyl, boletic acid monochrome 2-ethylhexyl, A boletic acid monochrome dodecyl, boletic acid monochrome octadecyl, boletic acid monochrome octadecenyl, Boletic acid monochrome cyclohexyl, a boletic acid monochrome benzyl, itaconic-acid monomethyl, Itaconic-acid monoethyl, itaconic-acid monopropyl, itaconic-acid monobutyl, An itaconic-acid monochrome n-octyl, itaconic-acid monochrome 2-ethylhexyl, itaconic-acid monochrome octadecyl, an itaconic-acid monochrome dodecyl, itaconic-acid monochrome cyclohexyl, itaconic-acid monochrome octadecenyl, an itaconic-acid monochrome benzyl, etc.

[0028] Sulfonic-acid system monomer: A styrene sulfonic acid, an alpha-methyl-styrene sulfonic acid, a vinyl sulfonic acid, a 2-(meta) acrylamide-isobutane sulfonic acid, an acrylamide (meta)-N-methyl sulfonic acid, an acrylamide (meta) phenyl propane sulfonic acid, an allyl-compound (meta) sulfonic acid, acrylic-acid (meta) sulfoethyl, an acrylic-acid (meta) sulfo propyl, acrylic-acid (meta) sulfo 2-hydroxypropyl, etc.

[0029] Sulfate system monomer: (meta) An acrylic-acid hydroxyethyl sulfate, an acrylic-acid (meta) hydroxypropyl sulfate, an acrylic-acid (meta) polyoxyalkylene sulfate, sulfuric-acid (meta) allyl-compound ester, an allyloxy (meta) polyoxyalkylene sulfate, etc.

[0030] Amide system monomer: (meta) An acrylamide, N-methylol (meta) acrylamide, N-methoxymethyl (meta) acrylamide, an N-ethoxy methyl (meta) acrylamide, an N-propoxy methyl (meta) acrylamide, an N-butoxy methyl (meta) acrylamide, etc.

[0031] Hydroxyalkyl system monomer: (meta) Acrylic-acid hydroxyethyl, acrylic-acid (meta) hydroxypropyl, acrylic-acid (meta) hydroxy butyl, an acrylic acid (meta) 2, 3-dihydroxy propyl, glycerol monochrome (meta) acrylate, GURISERINJI (meta) acrylate, pentaerythritol monochrome (meta) acrylate, pen TAERISURITORUJI (meta) acrylate, allyl alcohol (meta), etc.

[0032] Polyoxyalkylene-series monomer: A polyoxyalkylene (meta) acrylic ester, a polyoxyalkylene glycerol (meta) acrylic ester, a polyoxyalkylene monoalkyl (meta) acrylic ester, a polyoxyalkylene monochrome alkenyl (meta) acrylic ester, the polyoxyalkylene (meta) allyl-compound ether, the polyoxyalkylene glycerol (meta) allyl-compound ether, etc.

[0033] In addition, as an alkylene oxide which is the raw material of polyoxyalkylene here, ethylene oxide, a propylene oxide, butylene oxide, etc. are mentioned, and one or more kinds of compounds chosen from these groups are used. The repeat units of an alkylene oxide may be 1-50, and any of randomness, alternation, and a block are sufficient as a coupling case. Moreover, the carbon atomic

number of an alkyl group and an alkenyl machine is 1-4 pieces.

[0034] In the monomer (d) mentioned above, especially A vinylpyridine, N-methyl vinyl pyridinium (salt), N and N-dimethylamino styrene, trimethyl styryl ammonium (salt), N and N-dimethylamino methyl styrene, trimethyl styryl methylammonium (salt), Vinyl acetate, acrylonitrile (meta), a maleic acid, a maleic anhydride, Boletic acid, an itaconic acid, itaconic acid anhydride, maleic-acid monomethyl, Maleic-acid monoethyl, maleic-acid monopropyl, maleic-acid monobutyl, Boletic acid monomethyl, boletic acid monoethyl, boletic acid monopropyl, Boletic acid monobutyl, a styrene sulfonic acid, a vinyl sulfonic acid, a 2-(meta) acrylamide-isobutane sulfonic acid, An allyl-compound sulfonic acid, an acrylic-acid (meta) hydroxypropyl sulfate, (Meta) Sulfuric-acid (meta) allyl-compound ester, an acrylamide (meta), and N-methylol (meta) acrylamide are desirable. In this, furthermore, N-methyl vinyl pyridinium (salt), trimethyl styryl ammonium (salt), Trimethyl styryl ammonium (salt), vinyl acetate, acrylonitrile (meta), A maleic acid, a maleic anhydride, boletic acid, an itaconic acid, a styrene sulfonic acid, a vinyl sulfonic acid, a 2-(meta) acrylamide-isobutane sulfonic acid, an acrylamide (meta), and N-methylol (meta) acrylamide are suitable.

[0035] This monomer (d) may be the salt as what was mentioned by the component (c) and (refer to the (4) terms) with the independently same monomer (d) which may be two or more kinds of mixture.

[0036] (6) this invention copolymer (emulsification dispersant) which consists of monomers more than a copolymer may be used as a salt after a polymerization-reaction end with a compound which was mentioned by the monomer (c) and (refer to the (4) terms), and may be used as a salt before a polymerization. moreover, a copolymer -- under a polymerization or after a polymerization -- the 1st class amino group in a copolymer, the 2nd class amino group, and the 3rd class amino group -- the 2nd class amination and the 3rd class amination -- you may form the 4th class ammonium

[0037] The amount of a chain transfer agent (a) is 0.01 - 10 % of the weight preferably 0.01 to 20% of the weight to the sum total weight of a monomer (b) and a monomer (c) or a monomer (b), a monomer (c), and a monomer (d). At less than 0.01 % of the weight, if the molecular weight of a copolymer exceeds past [a large next door] and 20 % of the weight, decline in conversion will be seen and 0.01 - 20% of the weight of a then good emulsification dispersant out of range will not be obtained.

[0038] The amount of a monomer (b) is 10 - 95 % of the weight, the amount of a monomer (c) is 5 - 90 % of the weight, and the amount of a monomer (d) is 1 - 40 % of the weight. the average molecular weight of a copolymer -- 1,000-300,000 -- it is 5,000-100,000 preferably and a good emulsification dispersant is not obtained except the above-mentioned range Moreover, you may combine the monomer which constitutes a copolymer in any form among randomness, alternation, a block, and a graft.

[0039] (7) It has set to the copolymer in a polymerization method this invention (emulsification dispersant), and the polymerization method is solution polymerization, an emulsion polymerization, a suspension polymerization or a bulk-polymerization method, and the method of being front 3 persons preferably. As a solvent for polymerizations (medium), water and the organic solvent, for example, benzene, toluene, a xylene, a hexane, a cyclohexane, a heptane, an octane, a chloromethane, a chloroethane, a methanol, ethanol, isopropyl alcohol, butyl alcohol, ethylene glycol, a glycerol, ethyl acetate, an acetone, a methyl ethyl ketone, a methyl isobutyl ketone, a dioxane, a dimethylformamide, dimethyl sulfoxide, etc. are mentioned.

[0040] As a polymerization initiator, benzoyl peroxide, tert-butyl peroxide, Lauroyl peroxide, cumyl peroxide, tert-butyl hydroperoxide, Cumene hydroperoxide, azobisisobutyronitril, 2, and 2'-azobis - (2,4-dimethylvaleronitrile), A hydrogen peroxide, an ammonium persulfate, a sodium persulfate, potassium persulfate, 2 and 2'-azobis -(2-amidinopropane)- Radical supply agents, such as hydronalium chloride and a redox-system initiator (others [sodium hydrogen sulfite / ammonium-persulfate-/ hydrogen-peroxide-ferrous chloride and]), can be illustrated.

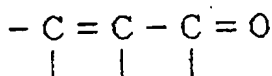
[0041] As an emulsifier for emulsion polymerizations, moreover, a fatty-acid salt, rosin acid chloride, a sulfation fatty-acid salt, An alkyl sulfonate, alkylbenzene sulfonates, alkyl naphthalenesulfonate, An alkyl sulfo fatty-acid-ester salt, a dialkyl sulfosuccinate, A polyoxyalkylene alkyl ether sulfo succinic-acid monoester salt, A polyoxyalkylene alkenyl ether SURUHOKOHAKU acid monoester salt, A polyoxyalkylene aryl ether SURUHOKOHAKU acid monoester salt, Alkyl diphenyl-ether disulfon acid

chloride, sulfated oil, a sulfation fatty-acid-ester salt, An alkyl-sulfuric-acid ester salt, an alkenyl sulfate salt, a polyoxyalkylene alkyl ether sulfate salt, A polyoxyalkylene alkenyl ethereal-sulfate ester salt, a polyoxyalkylene aryl ethereal-sulfate ester salt, An alkyl phosphate, a polyoxyalkylene-alkylether-phosphate ester salt, Anionic surfactants, such as polyoxyalkylene alkenyl ether phosphate and polyoxyalkylene aryl ether phosphate, Polyoxyalkylene alkyl ether, the polyoxyalkylene alkenyl ether, The polyoxyalkylene aryl ether, the polyoxyalkylene alkyl aryl ether, Polyoxyalkylene alkyl ester, polyoxyalkylene alkenyl ester, Polyoxyalkylene alkyl aryl ester, a polyoxyalkylene alkylamine, N and N-dihydroxyethyl alkylamide, polyoxyalkylene alkylamide, A glycerine fatty acid ester, polyglyceryl fatty acid ester, pentaerythritol fatty acid ester, Polyoxyalkylene pentaerythritol alkyl ester, a sorbitan fatty acid ester, A polyoxyalkylene sorbitan fatty acid ester, sucrose fatty acid ester, Nonionic surfactants, such as polyoxyalkylene sucrose fatty acid ester and polyoxyalkylene, An alkylamine salt, alkyl ammonium salt, an alkyl aralkyl ammonium salt, Cation nature surfactants, such as an alkyl pyridinium salt and an alkyl pico RINIUMU salt, Amphoteric surface active agents, such as an amino acid type, a betaine type, a sulfonic-acid type, a sulfate type, and a phosphoric ester type, Casein, the formalin condensate of beta-naphthalene sulfonic acid, a polycarboxylic-acid salt, Polyvinyl alcohol, a cellulosic, the poly (meta) acrylamide, A styrene-maleic-acid copolymer (or the derivative), a polyamide-epichlorohydrin resin, Macromolecule type surfactants, such as an amine-epichlorohydrin resin, an alkylene (poly) polyamine-epichlorohydrin resin, and a poly (diarylamine)-epichlorohydrin resin, etc. are mentioned, and the above surfactant can be used together.

[0042] the total amount of the mixture which consists of a chain transfer agent, a monomer, and a polymerization initiator (and need surfactant) in the polymerization of a copolymer -- the whole -- it is made for the remainder to serve as a medium (water, organic solvent) 20 to 80% of the weight preferably five to 90% of the weight 40-200 degrees C of polymerization temperature are 60-160 degrees C preferably.

[0043] (8) As rosin system matter rosin system matter, they are one or more kinds of rosin (e) chosen from rosin, such as a gum rosin, a wood rosin, and tall oil rosin, and these hydrogenation objects, a disproportionation object, the polymerization object, the aldehyde denaturation object, the alcoholic denaturation object, and the amine denaturation object, and the following-ization 14. [0044]

[Formula 14]



[0045] It is one or more kinds of compounds which the addition compound (f) of the acid compound (dienophile) which comes out and contains the basis expressed is mentioned, and are chosen from these groups, and the amount of (e) is the mixture whose amount of (f) is 5 - 100 % of the weight zero to 95% of the weight preferably.

[0046] (9) Although there are a method of using the organic solvent and the method of carrying out phase inversion emulsification without the organic solvent as a method of obtaining a rosin system emulsion sizing compound using the copolymer (emulsification dispersant) of a rosin system emulsion sizing-compound this invention, latter one is advantageous from a manufacturing-cost side.

[0047] As an example of the former method, the rosin system matter is first dissolved in the organic solvent, after emulsifying with a homogenizer and distilling off the organic solvent in an emulsion under manufacture and the reduced pressure to a degree of an emulsion with the water which contains a little acid compound if needed, a copolymer (emulsification dispersant) is added, it heat-treats below 70 degrees C, and an emulsion sizing compound is obtained. In this case, before homogenizing, you may add a copolymer.

[0048] Next, after adding the water which mixes the rosin system matter with a copolymer (emulsification dispersant) with melting temperature, and contains an acid compound first as an example

of the latter phase inversion emulsifying method if needed under churning and making the water-type (W/O) emulsion size in an oil form, phase inversion of the water is dropped and carried out further, and an oil-water-type (O/W) type emulsion sizing compound is obtained. In this case, you may carry out phase inversion using a homogenizer. Moreover, it is also possible to use together a surfactant which was mentioned as the aforementioned emulsifier for the emulsion polymerizations in (7) terms besides the copolymer.

[0049] For the rosin system matter, the copolymer (emulsification dispersant) of this invention is [the water of the rosin system emulsion sizing compound of this invention obtained in this way] 30 - 99% of the weight of a constituent 0.2 to 30% of the weight one to 70% of the weight.

[Translation done.]

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OPERATION

[Function] By using the emulsification dispersant (copolymer) of this invention, the emulsion particle of the rosin system matter becomes very detailed, and the sizing compound for handling at hypoviscosity with distributed stability easy very good is obtained. Although some synthetic-macromolecule type emulsification dispersants are proposed in recent years, as compared with these, the emulsification dispersant of this invention which uses 2 and 4-diphenyl-4-methyl-1-pentene as a chain transfer agent is excellent in above-mentioned many points. Moreover, the rosin system emulsion sizing compound of this invention is excellent in the distributed stability at the time of the hard water dilution, and its foaming which poses a problem in a paper-making process is low, and it enables the manifestation of an outstanding size effect which was impossible by the conventional rosin system emulsion sizing in wide range pH field applied to acid shell weak alkalinity.

[Translation done.]

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EXAMPLE

[Example] Hereafter, although an example and the example of comparison describe per the concrete operation gestalt of this invention, and effect, the technical range of this invention is not limited by these instantiation.

[0052] The example 12 of a polymerization, the 4-diphenyl-4-methyl-1-pentene 1 weight section, The ethyl-acrylate 10 weight section, the acrylic-acid sec-butyl 50 weight section, The methyl-methacrylate 35 weight section, the methacryloyloxy-ethyl trimethylammonium chloride 2 weight section, The methacryloyloxy-2-hydroxypropyl trimethylammonium chloride 3 weight section, The 2 and 2'-azobis-(2,4-dimethylvaleronitrile) 2 weight section, the isopropyl alcohol 80 weight section, and the ethylene glycol 20 weight section are mixed, the water 300 weight section is added after 7-hour churning at 80 degrees C, and it is to 25 degrees C after distilling off under reduced pressure of a solvent. It cooled. The average molecular weight of the obtained copolymer was 25,000.

[0053] The 2 of example 1 of example of comparison polymerization 1-a polymerization and 4-diphenyl-4-methyl-1-pentene 1 weight section was changed to the terpinolene (1, 4(8)-p-mentor diene) 2 weight section, the polymerization was carried out similarly, and the copolymer of average molecular weight 25,000 was obtained.

[0054] The 2 of example 1 of example of comparison polymerization 1-b polymerization and 4-diphenyl-4-methyl-1-pentene 1 weight section was changed to the beta-mercaptopropionic acid 0.2 weight section, the polymerization was carried out similarly, and the copolymer of average molecular weight 25,000 was obtained.

[0055] Three kinds of copolymers obtained in the above example 1 of a polymerization and example of comparison polymerization 1-a, and 1-b have monomer composition, a polymerization method, the same average molecular weight, etc., and are emulsification dispersants with which only chain transfer agents differ.

[0056] The example 22 of a polymerization, the 4-diphenyl-4-methyl-1-pentene 0.2 weight section, The styrene 35 weight section, the alpha-methyl-styrene 30 weight section, the p-methyl-styrene 5 weight section, The methacryloyl amino propyl dimethyl -2, the 3-dihydroxy propyl ammonium chloride 10 weight section, The acrylic-acid dimethylamino propyl amide 10 weight section, the methacryloyloxy neopentyl trimethylammonium chloride 10 weight section, The benzoyl peroxide 1 weight section, the methyl-ethyl-ketone 10 weight section, and the methyl-isobutyl-ketone 60 weight section are mixed, the water 400 weight section and the 35% hydrochloric-acid 6.7 weight section are added after 20-hour churning at 50 degrees C, and it is to 25 degrees C after distilling off under reduced pressure of a solvent. It cooled. The average molecular weight of the obtained copolymer was 85,000.

[0057] The 2 of example 2 of example of comparison polymerization 2-a polymerization and 4-diphenyl-4-methyl-1-pentene 0.2 weight section was changed to the thioglycolic-acid methyl 0.04 weight section, the polymerization was carried out similarly, and the copolymer of average molecular weight 85,000 was obtained.

[0058] The 2 of example 2 of example of comparison polymerization 2-b polymerization and 4-diphenyl-4-methyl-1-pentene 0.2 weight section was changed to the mixture of the beta-terpinene 0.1

weight section, the gamma-terpinene 0.1 weight section, and the 2-methyl -1 and the 4-cyclohexadiene 0.2 weight section, the polymerization was carried out similarly, and the copolymer of average molecular weight 85,000 was obtained.

[0059] Three kinds of copolymers obtained by the above example 2 of a polymerization, example of comparison polymerization 2-a, and 2-b have monomer composition, a polymerization method, the same average molecular weight, etc., and are emulsification dispersants with which only chain transfer agents differ.

[0060] The example 32 of a polymerization, the 4-diphenyl-4-methyl-1-pentene 5 weight section, The dodecane thiol 0.5 weight section, the carbon tetrabromide 0.5 weight section, the styrene 5 weight section, The methacrylic-acid n-butyl 3 weight section, the acrylic-acid dodecyl 2 weight section, the methacryloxy-ethyl dimethyl hydroxyethyl ammoniumchloride 30 weight section, The acryloyl aminopropyl trimethylammonium chloride 30 weight section, The dimethyl diaryl ammoniumchloride 30 weight section, the dodecyl-trimethylammonium-chloride 5 weight section, The polyvinyl alcohol (molecular weight 10,000) 1 weight section, the polyamine polyamide-epichlorohydrin resin (diethylenetriamine / adipic-acid / epichlorohydrin =10/10/1 mol) 10 weight section, The polyalkylene polyamine-epichlorohydrin resin (diethylenetriamine / epichlorohydrin =2 / one mol) 10 weight section, 2 and 2'-azobis -(2-amidinopropane)- The hydronalium chloride 10 weight section and the water 400 weight section are mixed, and it is after 3-hour churning and to 25 degrees C at 85 degrees C. It cooled. The average molecular weight of the obtained copolymer was 12,000.

[0061] The 2 of example 3 of example of comparison polymerization 3-a polymerization and 4-diphenyl-4-methyl-1-pentene 5 weight section was changed to the dodecane thiol 1 weight section, the polymerization was carried out similarly, and the copolymer of average molecular weight 12,000 was obtained.

[0062] The 2 of example 3 of example of comparison polymerization 3-b polymerization and 4-diphenyl-4-methyl-1-pentene 5 weight section was changed to the carbon tetrabromide 10 weight section, the polymerization was carried out similarly, and the copolymer of average molecular weight 12,000 was obtained.

[0063] Like the above, three kinds of copolymers of the example 3 of a polymerization which were obtained by carrying out, example of comparison polymerization 3-a, and 3-b have monomer composition, a polymerization method, the same average molecular weight, etc., and are dispersants with which only chain transfer agents differ.

[0064] Mixed stirring of the toluene of the amount from which the sum total concentration of the example 42 of a polymerization, the 4-diphenyl-4-methyl-1-pentene 10 weight section, the acrylic-acid 2-ethylhexyl 30 weight section, the methacrylic-acid dimethylamino propyl amide 70 weight section, the benzoyl peroxide 2 weight section and a chain transfer agent, a monomer, and a catalyst becomes 60 % of the weight was carried out, and it heated at 100 degrees C for 5 hours. Subsequently, the dimethyl sulfate of the one-mol equivalent was added to the water and the methacrylic-acid dimethylamino propyl amide from which the solid content of the 4th class ghost solution of a copolymer becomes 30 % of the weight, it was considered as the 4-hour reaction back at 40 degrees C, azeotropy was considered to toluene and water at about 100 degrees C, and it deliquored. The average molecular weight of the obtained copolymer was 6000.

[0065] The 2 of example 4 of example of comparison polymerization 4-a polymerization and 4-diphenyl-4-methyl-1-pentene 10 weight section was changed into the t-dodecyl-mercaptan 2 weight section, the polymerization was carried out similarly, and the copolymer of average molecular weight 6000 was obtained.

[0066] The example 52 of a polymerization, the 4-diphenyl-4-methyl-1-pentene 20 weight section, The ethyl-acrylate 30 weight section, the cyclohexyl methacrylate 5 weight section, The styrene 20 weight section, the acrylic-acid dimethylaminoethyl 5 weight section, the methacrylic-acid dimethylamino propyl amide 5 weight section, The methyl diarylamine 5 weight section, the dimethylamino styrene 10 weight section, The N-methyl vinyl pyridinium chloride 3 weight section, the acrylonitrile 10 weight section, The vinyl acetate 5 weight section, the methacrylic-acid hydroxyethyl 2 weight section, the

azobisisobutyronitril 10 weight section, The dimethyl sulfoxide 100 weight section and the dimethylformamide 100 weight section were mixed, and at 95 degrees C, the water 400 weight section and the 35% hydrochloric-acid 19.1 weight section were added after 6-hour churning, and it cooled to 25 degrees C after distilling off under reduced pressure of a solvent. The average molecular weight of the obtained copolymer was 1,000.

[0067] The example 1 (example 1 of manufacture of the rosin system matter) of reference After carrying out heating melting of the formaldehyde processing tall oil rosin 93 weight section, the boletic acid 7 weight section was added to the melt, it agitated at 200 degrees C for 3 hours, and strengthening rosin was obtained.

[0068] The example 2 (example 2 of manufacture of the rosin system matter) of reference After carrying out heating melting of the gum-rosin 92 weight section, the maleic-anhydride 8 weight section was added to the melt, it agitated at 200 degrees C for 3 hours, and strengthening rosin was obtained.

[0069] The example 3 (example 3 of manufacture of the rosin system matter) of reference After carrying out heating melting of the tall oil rosin 94 weight section, the glycerol 6 weight section was added to the melt, it cooled to 200 degrees C after 8-hour churning at 270 degrees C, the maleic-anhydride 6 weight section was added further, it agitated at 200 degrees C for 3 hours, and strengthening rosin was obtained.

[0070] After added the copolymer 10 weight section (solid-content conversion) of the example 1 of a polymerization under churning heating and after carrying out melting at 150 degrees C, having made the strengthening rosin 190 weight section of the example 1 of distributed example 1 reference into the W/O type emulsion, having added gradually 95-100-degree C hot water, carrying out phase inversion to the O/W type and adding hot water further, it cooled to 25 degrees C. The solid content of the obtained emulsion (sizing compound) was 50 % of the weight, and the copolymer content in a solid content was 5 % of the weight.

[0071] The copolymer in the example 1 of example of comparison distribution 1-a distribution was changed to the copolymer of example of comparison polymerization 1-a, strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) of 50 % of the weight of solid-content contents and 5 % of the weight of copolymer contents in a solid content was obtained.

[0072] The copolymer in the example 1 of example of comparison distribution 1-b distribution was changed to the copolymer of example of comparison polymerization 1-b, strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) of 50 % of the weight of solid-content contents and 5 % of the weight of copolymer contents in a solid content was obtained.

[0073] The copolymer in the example 1 of example of comparison distribution 1-c distribution was changed to poliomyelitis KISHIECHI range styrene-ized phenyl-ether sulfo succinic-acid monoester sodium salt (oxyethylene unit 15), strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) of 5 % of the weight of emulsification dispersants in 50 % of the weight of solid-content contents and a solid content was obtained.

[0074] The strengthening rosin 196 weight section of the example 2 of distributed example 2 reference was dissolved into the toluene 200 weight section, and after adding the copolymer 4 weight section (solid-content conversion) and water of the example 2 of a polymerization and making it emulsify with a homogenizer, toluene was distilled off under reduced pressure. The solid-content content of the obtained emulsion (sizing compound) was 40 % of the weight, and the copolymer content in a solid content was 2 % of the weight.

[0075] The copolymer in the example 2 of example of comparison distribution 2-a distribution was changed to the copolymer of example of comparison polymerization 2-a, strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) of 40 % of the weight of solid-content contents and 2 % of the weight of copolymer contents in a solid content was obtained.

[0076] The copolymer in the example 2 of example of comparison distribution 2-b distribution was changed to the copolymer of example of comparison polymerization 2-b, strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) of 40 % of the weight of solid-

content contents and 2 % of the weight of copolymer contents in a solid content was obtained.

[0077] Although the copolymer in the example 2 of example of comparison distribution 2-c distribution was changed to the polyalkylene polyamine-epichlorohydrin resin (a diethylenetriamine / epichlorohydrin =2 / one mol) and strengthening rosin was distributed similarly, the rosin system matter dissociated immediately after and the emulsion (contrast sizing compound) was not obtained.

[0078] After added the copolymer 16 weight section (solid-content conversion) of the example 3 of a polymerization at 150 degrees C after carrying out melting, heating and, having made the strengthening rosin 184 weight section of the example 3 of distributed example 3 reference into the W/O type emulsion, having added gradually 95-100-degree C hot water, carrying out phase inversion to the O/W type and adding hot water further, it cooled to 25 degrees C. The solid-content content of the obtained emulsion (sizing compound) was 50 % of the weight, and the copolymer content in a solid content was 8 % of the weight.

[0079] The copolymer in the example 3 of example of comparison distribution 3-a distribution was changed to the copolymer of example of comparison polymerization 3-a, strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) of 50 % of the weight of solid-content contents and 8 % of the weight of copolymer contents in a solid content was obtained.

[0080] The copolymer in the example 3 of example of comparison distribution 3-b distribution was changed to the copolymer of example of comparison polymerization 3-b, strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) 50 % of the weight of solid-content contents and whose amount of copolymers in a solid content are 8 % of the weight was obtained.

[0081] The copolymer in the example 3 of example of comparison distribution 3-c distribution was changed to the polyoxyethylene nonylphenyl ethereal-sulfate ester ammonium salt (oxyethylene unit 9), strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) 50 % of the weight of solid-content contents and whose amount of surfactants in a solid content are 8 % of the weight was obtained.

[0082] The copolymer in the example 1 of distributed example 4 distribution was changed to the copolymer of the example 4 of a polymerization, strengthening rosin was distributed similarly, and the emulsion (sizing compound) of 50 % of the weight of solid-content contents and 5 % of the weight of copolymer contents in a solid content was obtained.

[0083] The copolymer in the example 1 of example of comparison distribution 4-a distribution was changed to the copolymer of example of comparison polymerization 4-a, strengthening rosin was distributed similarly, and the emulsion (contrast sizing compound) of 50 % of the weight of solid-content contents and 5 % of the weight of copolymer contents in a solid content was obtained.

[0084] The copolymer in the example 1 of distributed example 5 distribution was changed to the copolymer of the example 5 of a polymerization, strengthening rosin was distributed similarly, and the emulsion (sizing compound) of 50 % of the weight of solid-content contents and 5 % of the weight of copolymer contents in a solid content was obtained.

[0085] The result of the foaming sex test and a size performance test is put in block to Table 2, respectively, and the particle diameter of the sizing compound obtained by the above each distributed example and example of comparison distribution and a contrast sizing compound, viscosity, mechanical stability, storage stability, and the hard water dilution stability are shown in Table 1. In addition, the measuring method of each property is as follows.

[0086]

[Table 1]

試料	物性 粒子徑 (μm)	粘 度 (c p s)	機械的 安定性 (%)	貯藏 安定性 (%)	硬水希釈 安定性
分散例 1	0.25	20	≤ 0.08	≤ 0.07	○
比較分散例 1 - a	0.73	460	8	15	×
比較分散例 1 - b	0.90	205	11	28	×
比較分散例 1 - c	0.40	101	0.7	0.8	×
分散例 2	0.27	35	≤ 0.09	≤ 0.08	○
比較分散例 2 - a	0.81	180	20	20	×
比較分散例 2 - b	1.24	169	40	33	×
比較分散例 2 - c	測定不能	—	—	分離	—
分散例 3	0.26	15	≤ 0.09	≤ 0.07	○
比較分散例 3 - a	2.91	120	83	60	×
比較分散例 3 - b	1.55	230	57	51	×
比較分散例 3 - c	0.39	114	0.66	0.59	×
分散例 4	0.25	21	≤ 0.08	≤ 0.07	○
比較分散例 4 - a	0.44	70	8	16	×
分散例 5	0.27	22	≤ 0.10	≤ 0.08	○

[0087]

(1) Particle diameter : dynamic-light-scattering photoelectric spectrophotometer (DLS)

(2) Viscosity : Brookfield viscometer (60rpm, 25 degrees C)

(3) Mechanical stability : Merlon formula stability-test machine (5kg of loads, 1000rpm \times 10min, 200-mesh-on)

(4) Storage stability : measure the amount of aggregates of 30 days after (40 degrees C).

(5) Hard water dilution stability : state when putting one drop of emulsion into hard water of DH the degree of hardness of 200 degrees (25 degrees C) Distributed O, condensation x. [0088]

[Table 2]

試料	発泡性試験 (ml)		ステキヒトサイズ度 (秒)	
	直後	5分後	サイズ剤量 0.15%	サイズ剤量 0.3%
分散例 1	5	0	24.5	34.0
比較分散例 1 - a	41	10	2.7	11.0
比較分散例 1 - b	36	11	3.0	11.6
比較分散例 1 - c	100	79	1.5	5.0
分散例 2	9	0	30.1	35.0
比較分散例 2 - a	39	20	4.5	12.4
比較分散例 2 - b	36	12	5.0	13.4
比較分散例 2 - c	—	—	—	—
分散例 3	13	1	23.9	33.9
比較分散例 3 - a	61	24	1.9	8.6
比較分散例 3 - b	59	20	1.9	8.7
比較分散例 3 - c	100	85	0.8	3.9
分散例 4	6	0	26.9	34.1
比較分散例 4 - a	59	21	2.3	8.9
分散例 5	10	0	21.5	32.8

[0089] (1) After it added 1,000g of ion exchange water to 0.24g of 8% aluminum-sulfate solution of manufacture of foaming sex-test (b) composition hard water and the sulfuric acid adjusted to pH 4.5, it adjusted to the electrical conductivity omega of 1,000micro using the sodium sulfate.

(b) The *-ed sizing compound was diluted with examining method above-mentioned composition hard water to 5% (sizing-compound solid-content conversion), and this was put into 200ml stoppered cylinder 100ml, it shook strongly 10 times, and the amount (ml) of the bubble immediately after and after 5-minute neglect was measured.

[0090] (2) Clay 10% (opposite pulp) was added to 2.4% pulp slurry (N agent : L agent = 1:1) of size performance tests, 0.2% (opposite pulp) of aluminium sulfate was added after adding a *-ed sizing compound under churning, and paper making was prepared and carried out to pH 7.5 by NaOH. this -- 20 degrees C and 60% of constant temperature -- Stockigt sizing degree was measured by the method of a JIS convention after 24-hour neglect in the state of constant humidity

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CLAIMS

(57) [Claim(s)]

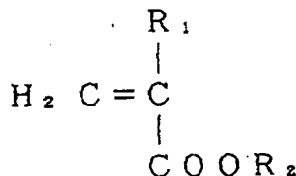
[Claim 1] The emulsification dispersant for rosin system emulsion sizing compounds which makes 2 and 4-diphenyl-4-methyl-1-pentene (a) an indispensable chain transfer agent, and is characterized by the bird clapper from the copolymer and/or its salt of an acrylic-ester (meta) system and/or a styrene system monomer (b), and the amino group and/or an ammonium content monomer (c) (salt).

[Claim 2] The emulsification dispersant according to claim 1 with which the amount of a chain transfer agent (a) consists of a copolymer the average molecular weight of whose it is the copolymer whose amount of 10 - 95 % of the weight and a monomer (c) the amount of a monomer (b) is 5 - 90 % of the weight, and is 1,000-300,000, and/or its salt 0.01 to 20% of the weight to the sum total weight of a monomer (b) and a monomer (c).

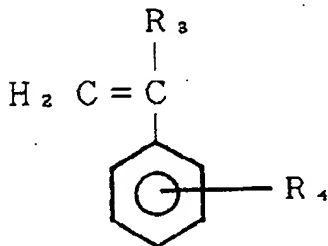
[Claim 3] The emulsification dispersant containing one or more kinds of monomers (d) chosen from the group which consists of a vinylpyridine system, an amino styrene system, an alkylamino styrene system, a vinyl-ester system, a nitril system, a dicarboxylic-acid system, a dicarboxylic-acid monoester system, a sulfonic-acid system, a sulfate system, an amide system, a hydroxyalkyl system, and a polyoxyalkylene series monomer further as a monomer which constitutes a copolymer according to claim 1.

[Claim 4] The emulsification dispersant according to claim 3 with which the amount of 10 - 95 % of the weight and a monomer (c) consists of a copolymer the average molecular weight of whose the amount of a chain transfer agent (a) is the copolymer whose amount of 5 - 90 % of the weight and a monomer (d) the amount of 0.01 - 20 % of the weight and a monomer (b) is 1 - 40 % of the weight to the sum total weight of a monomer (b), a monomer (c), and a monomer (d), and is 1,000-300,000, and/or

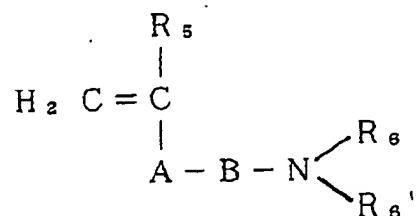
[Claim 5] The acrylic-ester (meta) system monomer of a monomer (b) is the following general formula-ization 1. [Formula 1]



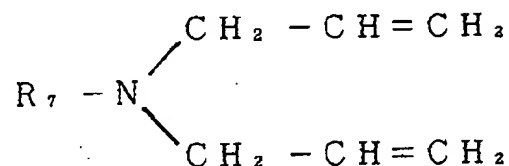
The styrene system monomer of a monomer (b) is the following general formula-ization 2. [Formula 2]



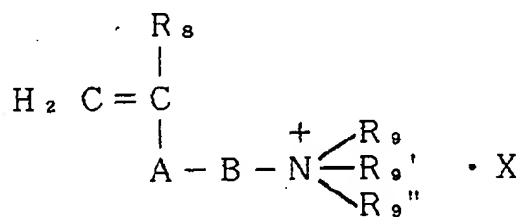
The amino-group content monomers of a monomer (c) are the formation 3 of the following general formula, and/or ** 4. [Formula 3]



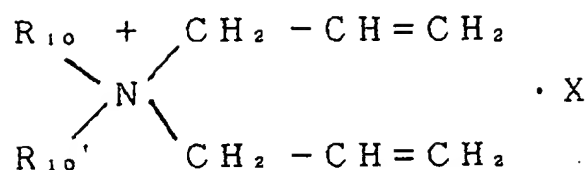
[Formula 4]



Furthermore, the ammonium content monomers of a monomer (c) are the formation 5 of the following general formula, and/or ** 6. [Formula 5]



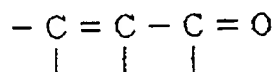
[Formula 6]



(式中 R_1 、 R_3 、 R_5 、 R_8 は水素又はメチル基を、 R_2 は炭素原子数 1～2 個のアルキル基、アルケニル基、シクロアルキル基、シクロアルケニル基、アリール基、アラルキル基、又はアラルケニル基を、 R_4 は水素、メチル基、エチル基、イソプロピル基又は *tert*-ブチル基を、 R_6 、 R_6' 、 R_7 は水素、メチル基、エチル基、プロピル基、ベンジル基、ヒドロキシエチル基、ヒドロキシプロピル基、ジヒドロキシプロピル基又はグリシジル基を、 R_9 、 R_9' 、 R_9'' 、 R_{10} 、 R_{10}' はメチル基、エチル基、プロピル基、ベンジル基、ヒドロキシエチル基、ヒドロキシプロピル基、ジヒドロキシプロピル基又はグリシジル基を、 A は $-CO-O-$ 又は $-CO-NH-$ を、 B は $-(CH_2)_2-$ 、 $-(CH_2)_3-$ 、 $-CH_2C(CH_3)_2CH_2-$ 又は $-CH_2CH(OH)CH_2-$ を、 X は塩を形成するアニオンを示す。)

The emulsification dispersant according to claim 1 to 4 which is one or more kinds of monomers (salt) chosen from the group which consists of a monomer (salt) expressed.

[Claim 6] The basis expressed in the following-ization 7 as a dispersant according to claim 1 to 5, a gum rosin and a wood rosin, and one or more kinds of rosin (e) chosen as the tall oil rosin row from these hydrogenation objects, a disproportionation object, the polymerization object, the aldehyde denaturation object, the alcoholic denaturation object, and the amine denaturation object. [Formula 7]



The rosin system emulsion sizing compound for paper manufacture characterized by the bird clapper from the rosin system matter chosen from the group which consists of an acid compound which *****, and an addition compound (f) with the above (e), and water.

[Claim 7] The sizing compound according to claim 6 whose amount of 0.2 - 30 % of the weight and water the amount of a dispersant with the amount of the rosin system matter given in either of one to 1 - 70-% of the weight and claim 5 terms is 30 - 99 % of the weight.

[Translation done.]